

Going and Coming: Survival and Timing of PIT-Tagged Juvenile and Adult Salmonids in the Columbia River Estuary



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Background

- 1995: Estuarine detection of PIT-tagged juvenile salmonids begins
 - Purpose: Document timing of transported juvenile salmonids just prior to ocean entry
- 1998: Sampling expanded
 - Purpose: Include timing of inriver migrants and complete hydrosystem reach survival estimates to Bonneville Dam
- 2011: Estuarine PIT detection of returning adult salmonids begins
 - Purpose: Document timing and estimate survival upstream to Bonneville Dam

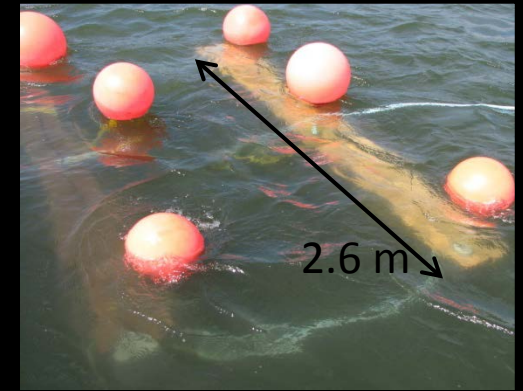
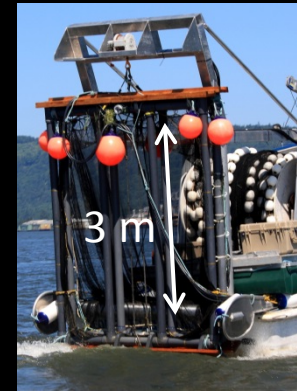
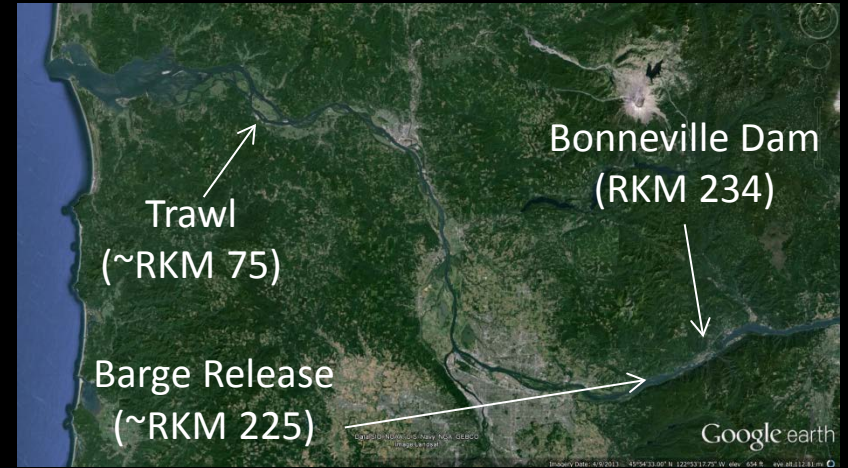
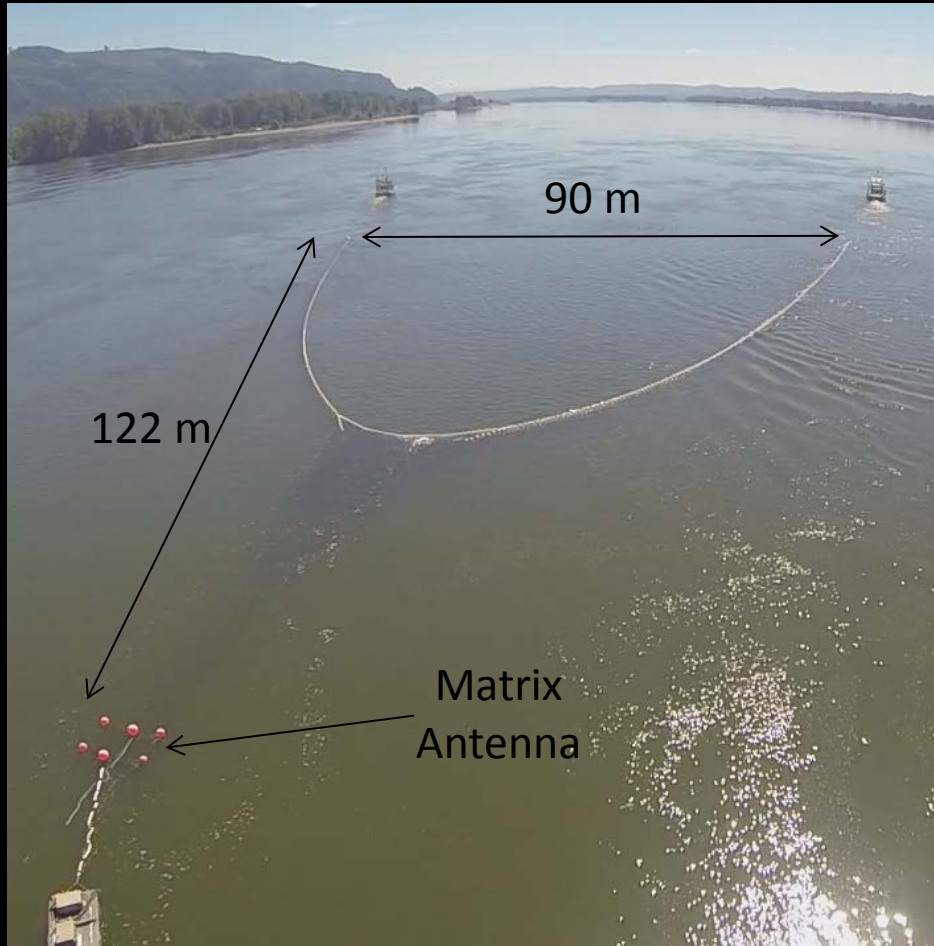


Outline

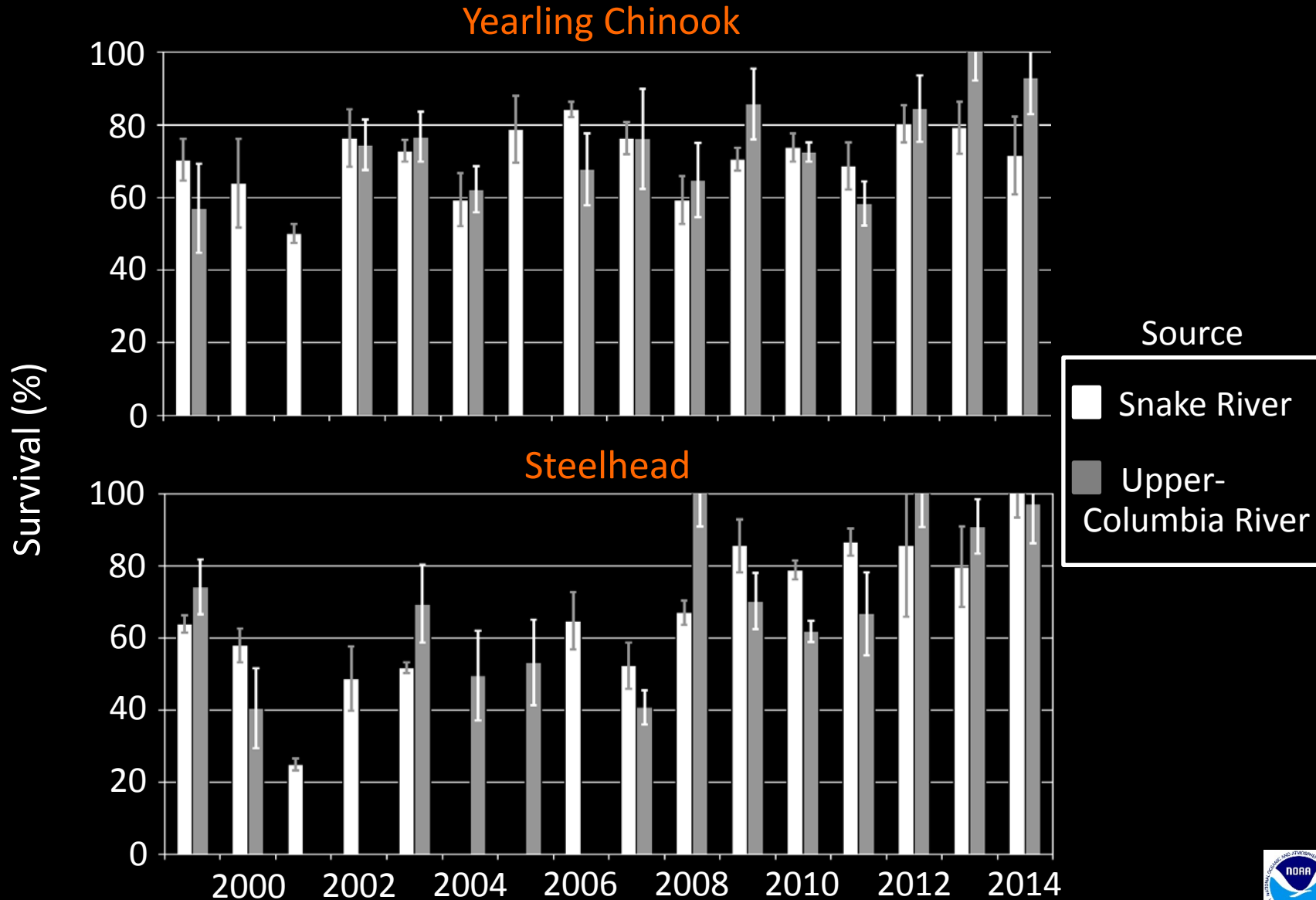
- Highlight 15 years of juvenile detection data (trawl)
- Highlight 4 years of adult detection data (pile dike)



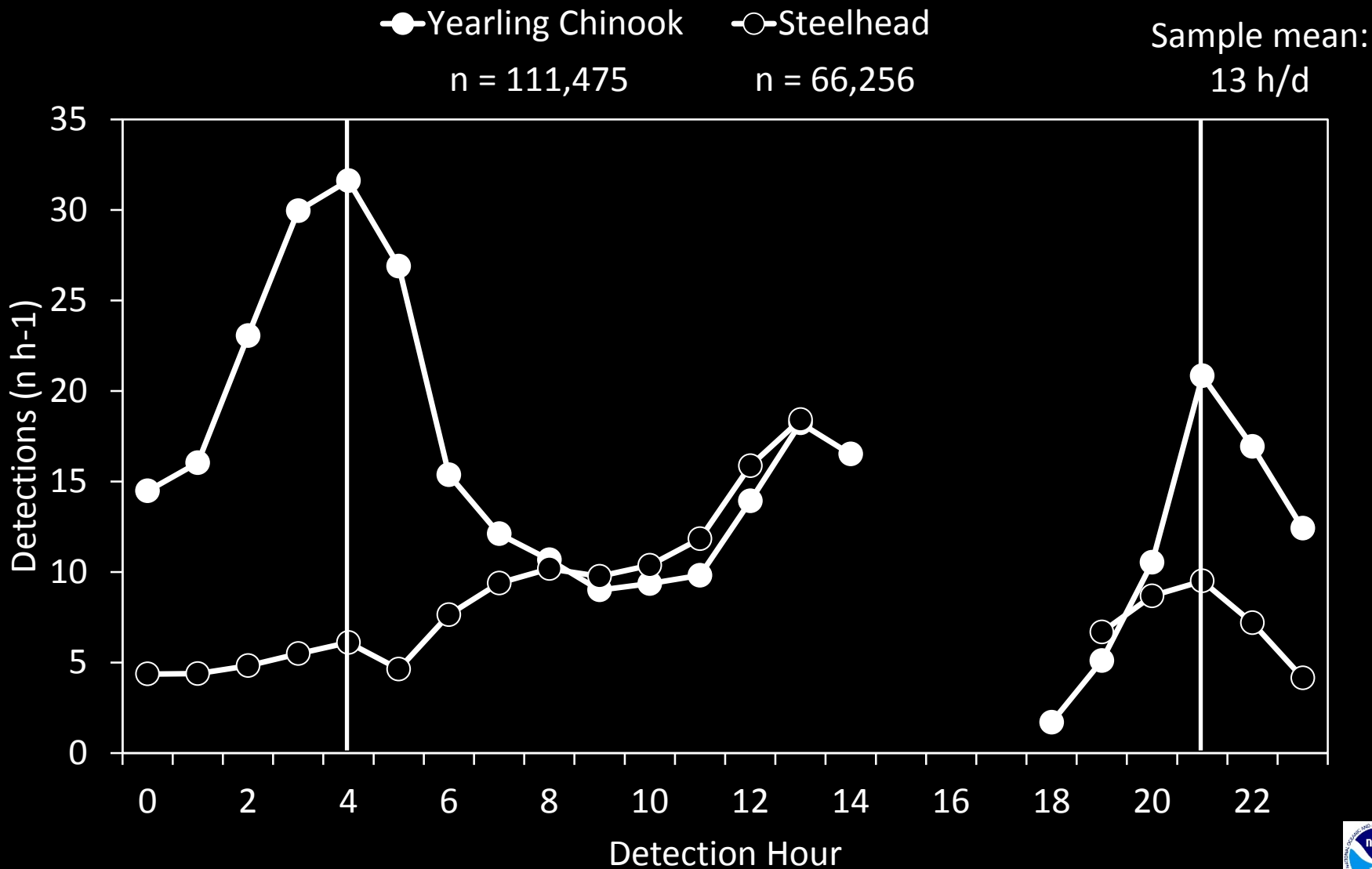
Detecting Outmigrating Juvenile Salmonids with a Trawl



Survival of Juvenile Yearling Chinook and Steelhead, McNary to Bonneville Dam



Diel Behavior of Juvenile Yearling Chinook and Steelhead, 2003-2014



Travel Time (d) of Juvenile Yearling Chinook and Steelhead

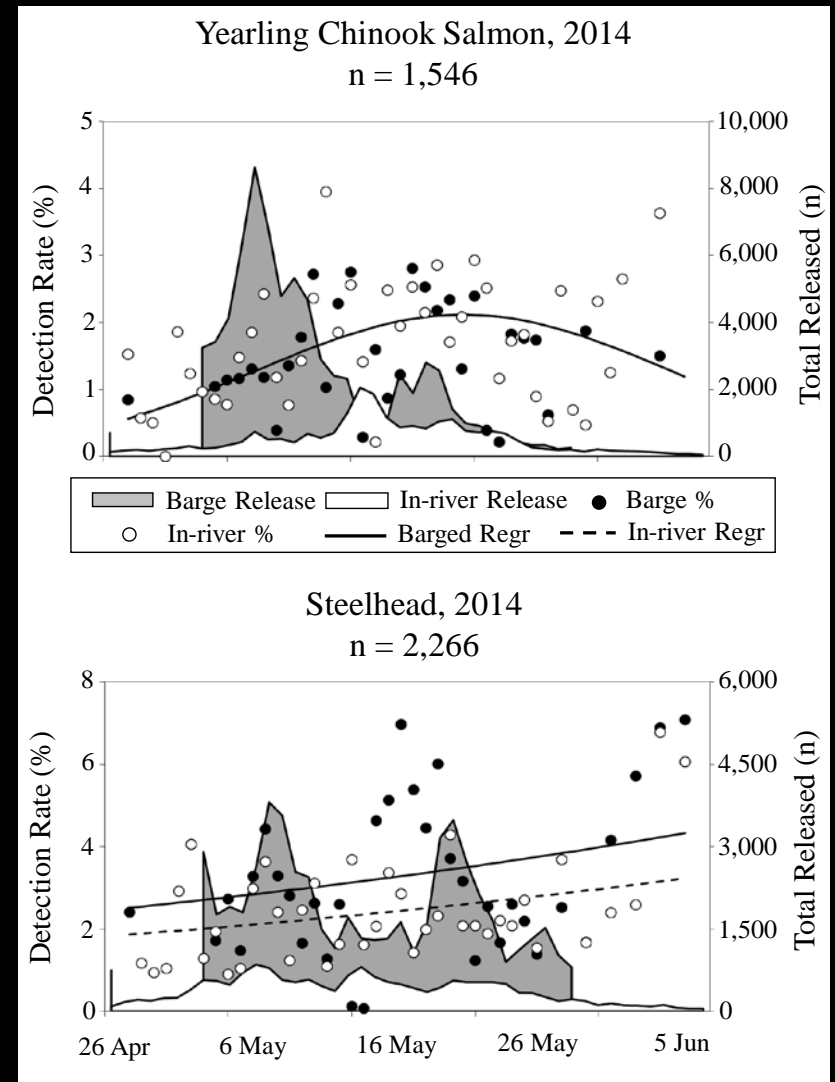
	Detection at Lower Granite Dam (rkm 695)		Detection at Bonneville Dam (rkm 234)		Release from transportation barge (rkm 225)		
	Yearling Chinook salmon	Steelhead	Yearling Chinook salmon	Steelhead	Yearling Chinook salmon	Steelhead	Flow
2000	17.4	17.1	1.7	1.7	1.9	1.6	7,415
2001	32.9	30.1	2.3	2.5	2.9	2.3	3,877
2002	18.2	17.8	1.8	1.7	2	1.6	8,071
2003	17.0	16.5	1.8	1.7	2.1	1.7	7,120
2004	16.6	16.6	1.9	2	2.2	1.9	6,663
2005	17.3	16.9	1.8	2	2.2	1.9	5,776
2006	14.7	12.5	1.7	1.6	2.1	1.6	9,435
2007	15.7	15.6	1.7	1.7	2.2	1.7	6,858
2008	18.3	14.4	1.7	1.6	2.1	1.6	8,714
2009	18.7	15.4	1.7	1.7	2.1	1.6	7,871
2010	16.1	14.8	2.0	1.9	2.2	2.0	6,829
2011a	17.8	15.5	1.8	1.6	2.1	1.6	7,911
2011b	13.2	10.0	1.5	1.3	1.6	1.5	13,462
2012	15.4	11.2	1.6	1.5	2.0	1.5	10,056
2013	14.1	11.6	1.6	1.6	2.2	1.6	7,470
2014	16.4	12.3	1.6	1.6	2.1	1.5	8,281
*Mean	16.5	14.5	1.7	1.7	2.1	1.6	7,671

*Excludes 2001



Detection Rates by Migration History

	Yearling Chinook	Steelhead
2000	inriver	barged
2001	inriver	inriver
2002	ND	variable
2003	variable	variable
2004	variable	barged
2005	ND	ND
2006	inriver	ND
2007	ND	inriver
2008	variable	inriver
2009	inriver	ND
2010	inriver	inriver
2011	inriver	ND
2012	inriver	barged
2013	inriver	variable
2014	ND	barged
Inriver	8	4
Barged	0	4
Variable	3	3
No Difference	4	4

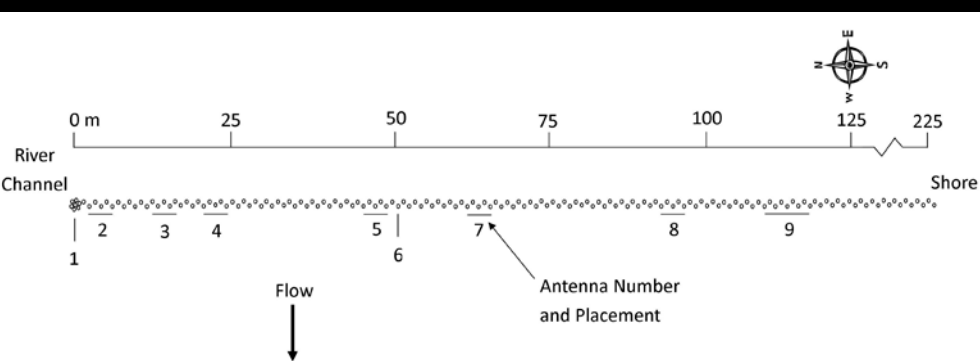
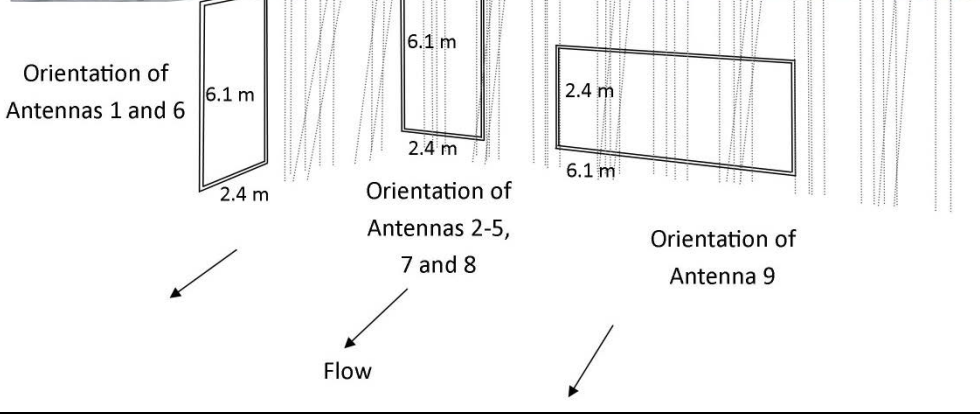
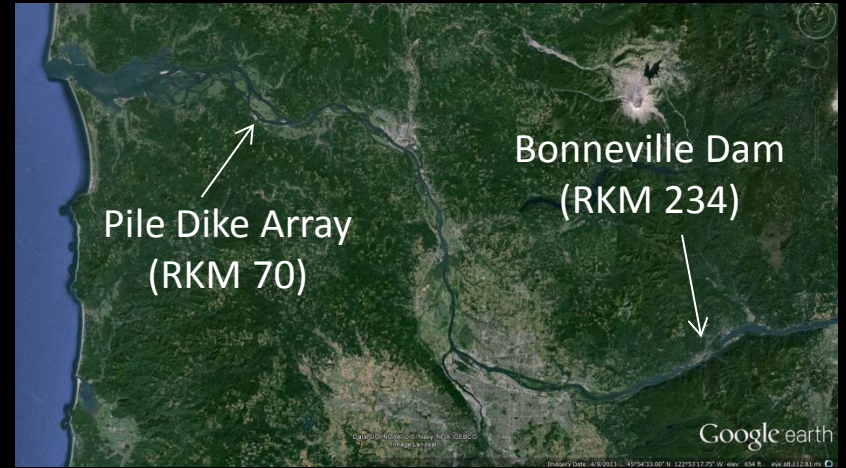


Juvenile Salmonid Highlights

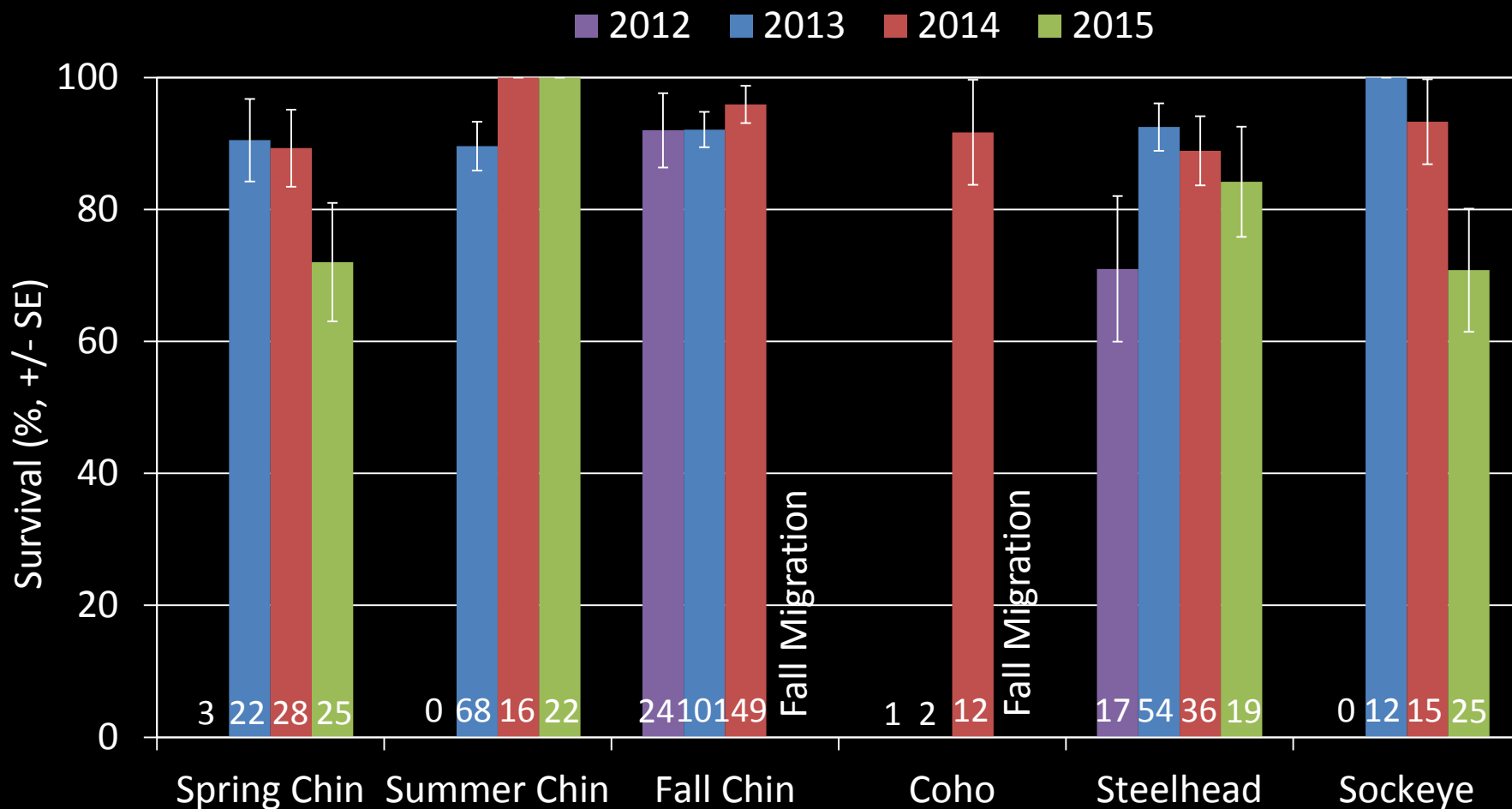
- Trawl detections of yearling Chinook peaked at dawn and dusk, steelhead late morning
- Travel time
 - Steelhead travelled faster than yearling Chinook from Lower Granite Dam, same speed from Bonneville Dam
 - Inriver-migrating yearling Chinook travelled faster than barged, no difference for steelhead
- Detection rates of yearling Chinook were always higher for inriver migrants if a difference was present, no apparent trend for steelhead



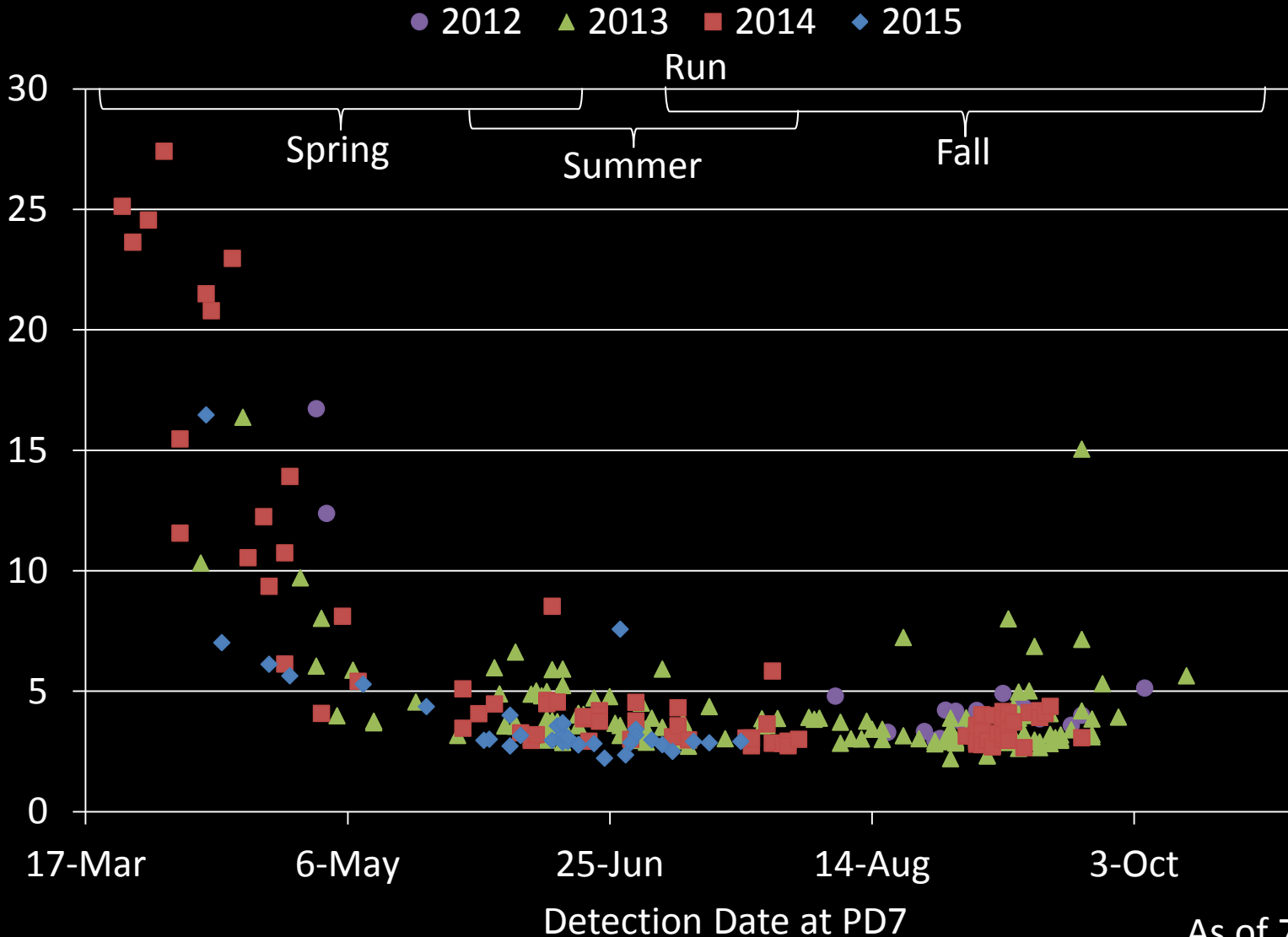
Detecting Returning Adult Salmonids Using Antennas Mounted on a Pile Dike



Survival of Adult Salmonids, PD7 to Bonneville Dam (RKM 70-234)



Travel Time of Chinook Salmon, PD7 to Bonneville Dam (RKM 70 to 234)



2012-2015

means:

Spring
8.6 d

Summer
3.8 d

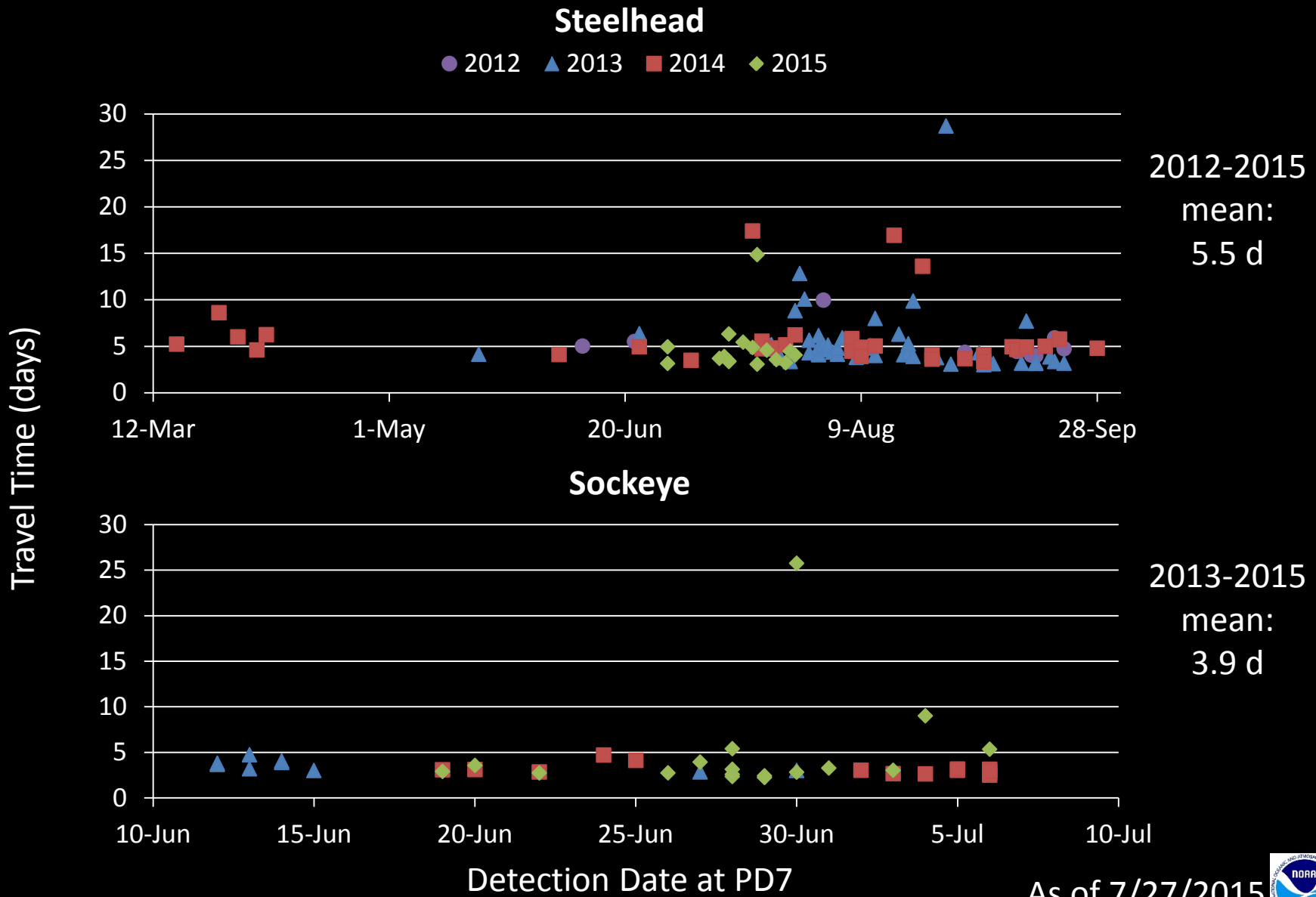
Fall
3.7 d



As of 7/27/2015



Travel Time of Steelhead and Sockeye Salmon, PD7 to Bonneville Dam (RKM 70 to 234)



As of 7/27/2015



Adult Salmonid Highlights

- Survival from PD7 to Bonneville Dam was lower in 2015 for Spring Chinook and Sockeye
- Travel time
 - Earlier migrating Spring Chinook took longer to get to Bonneville Dam than later migrants
 - Spring Chinook travelled significantly slower than summer and fall Chinook
 - Steelhead travelled significantly slower than every species/run except Spring Chinook
 - Sockeye travelled slower in 2015 than in the previous two years
- Migration period for Sockeye was only ~3 weeks



Acknowledgements

- BPA
 - Barbara Shields, John Piccininni, and Scott Bettin.
- USACE
 - Brad Eppard.
- NOAA
 - Bruce Jonasson, Gabriel Brooks, Sandy Downing, Kurt Fresh, Richie Graves, Gary Fredricks, Kinsey Frick, Rich Zabel, and Blane Bellerud.
- PSMFC
 - Randy Fisher, Russell Porter, and Rick Martinson.
- OAI
 - Lindsey Webb, Alex Borsky, Kaya Johnson, Terry Roe, Brian Kelly, Day'e Hix, Joe Aga, Juleen Savarese, Mike Laurs, Peter Milone, and all of our seasonal boat operators, deckhands, and biologists.

